

Laude's CH301 Worksheet 4: Advanced Lewis Structures (Sections 2.8-2.17)
 (The textbook referenced is Atkins & Jones's *Chemical Principle*, 3rd edition)

1. Draw the different resonance structures: (feel free to work on similar problems in the text: 2.41-2.44, pg 80)

Compound	Total number of electrons	Resonance structures (Lewis dots structures)
SO ₂		
NO ₃ ⁻		
CO ₃ ²⁻		
Benzene		
CH ₃ COO ⁻		

2. Calculate formal charge: (feel free to work similar problems in the text: 2.45-2.48 pg 80)

Compounds	Total number of e	Lewis structures	Formal charge of each atom	Most stable?
HCOH and HCH O				
HCN and HNC				
COO and OCO				
OCiH and ClOH				
ONF and NFO and NOF				

3. Exceptions to the octet rule: (feel free to work similar problem from text: 2.49-58 pg. 81)

Compounds	Total number of electrons	Lewis dot structure	What is strange about this structure?
XeO ₄			
ICl ₂ ⁻			
SF ₄			
ClO ₃ ⁻			
BrO			
BCl ₃			

4. Rank the following in increasing order according to the property listed:

Electron affinity

Cl, N, Mg and He

Br, I, P and K

S, H, Sn and Ba

Si, Ca, Ga and O

Bond polarity

O-H, C-F and O-O

Si-Cl, Se-S and K-I

Polarizing power

Br⁻, Be²⁺ and Ca²⁺

Cr⁴⁺, Na⁺ and Al³⁺

Bond strength

C=O, N≡N and NaCl

O-O, N-O and C-O

Bond length

C-H, C=O and C≡N